

IN THE CLAIMS

Please amend the claims as follows:

Claims 1-25 (Canceled).

Claim 26 (New): A method of detecting radiation comprising:
providing a layer of high purity single crystal CVD diamond;
applying an electric field of no greater than 0.5 V/ μ m to the layer;
exposing the layer to the radiation thereby generating a signal; and
detecting the signal.

Claim 27 (New): A method according to claim 26 wherein the electric field applied to the diamond layer is less than 0.3 V/ μ m.

Claim 28 (New): A method according to claim 26 wherein the electric field applied to the diamond layer is less than 0.2 V/ μ m.

Claim 29 (New): A method according to claim 26 wherein the electric field applied to the diamond layer is less than 0.15 V/ μ m.

Claim 30 (New): A method according to claim 26 wherein a thickness of the layer does not exceed 1 mm.

Claim 31 (New): A method according to claim 26 wherein a thickness of the layer is less than 500 μ m.

Claim 32 (New): A method according to claim 26 wherein a thickness of the layer is less than 250 μm .

Claim 33 (New): A method according to claim 26 wherein a bias voltage less than 300 V is applied to the layer.

Claim 34 (New): A method according to claim 26 wherein a bias voltage less than 200 V is applied to the layer.

Claim 35 (New): A method according to claim 26 wherein a bias voltage less than 100 V is applied to the layer.

Claim 36 (New): A method according to claim 26 wherein a bias voltage less than 75 V is applied to the layer.

Claim 37 (New): A method according to claim 26 wherein the CVD diamond layer reaches at least 80% of saturated charge collection efficiency at the applied electric field.

Claim 38 (New): A method according to claim 26 wherein the CVD diamond layer reaches at least 90% of saturated charge collection efficiency at the applied electric field.

Claim 39 (New): A method according to claim 26 wherein the CVD diamond layer reaches at least 95% of saturated charge collection efficiency at the applied electric field.

Claim 40 (New): A method according to claim 26 wherein the CVD diamond layer is capable of generating at least 7000 electrons per detection event for minimum ionising particles when operated at the applied electric field.

Claim 41 (New): A method according to claim 26 wherein the CVD diamond layer is capable of generating at least 9000 electrons per detection event for minimum ionising particles when operated at the applied electric field.

Claim 42 (New): A method according to claim 26 wherein the CVD diamond layer is capable of generating at least 12000 electrons per detection event for minimum ionising particles when operated at the applied electric field.

Claim 43 (New): A method according to claim 26 wherein the CVD diamond layer is capable of generating at least 15000 electrons per detection event for minimum ionising particles when operated at the applied electric field.

Claim 44 (New): A method according to claim 26 wherein the radiation is alpha particles and the CVD diamond is such that it generates a peak width (FWHM) in energy, expressed as $\pm E/E$, less than 20%.

Claim 45 (New): A method according to claim 26 wherein the radiation is selected from beta particles, alpha particles, protons, other high energy nuclear particles, and high energy electromagnetic radiation.

Claim 46 (New): A method according to claim 26 wherein the radiation is neutrons.

Claim 47 (New): A detector for use in a method according to claim 26 comprising a layer of high purity single crystal CVD diamond.

Claim 48 (New): A detector according to claim 47 wherein the layer of high purity single crystal CVD diamond is a thin layer.

Claim 49 (New): A detector according to claim 47 wherein the layer of high purity single crystal CVD diamond has a thickness of less than 1 mm.

Claim 50 (New): A detector according to claim 47 for use in a stand-alone, remote, or hand-held device.